
50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status and Designation of Critical Habitat for the Kentucky Cave Shrimp

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Service determines the Kentucky cave shrimp (*Palaemonias ganteri* Hay) to be an Endangered species and designates its Critical Habitat. This action is being taken because the only known population of this species occurs in Mammoth Cave National Park, where it faces the threat of contamination of the ground water supply to its habitat. Inadequate sewage treatment facilities in nearby communities and possible spills of toxic substances along local highways are the basis of this threat.

DATE: This rule becomes effective November 14, 1983.

ADDRESS: Questions concerning this action may be addressed to the Associate Director—Federal Assistance, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

FOR FURTHER INFORMATION CONTACT: Mr. John L. Spinks, Jr., Chief, Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240 (703/235-2771).

SUPPLEMENTARY INFORMATION:

Background

The Kentucky cave shrimp (*Palaemonias ganteri* Hay) is a crustacean of the family Atyidae. This species has been found only in the Flint-Mammoth Cave System within Mammoth Cave National Park in Kentucky. Its reduced eyes and lack of pigmentation indicate that the species has had a long history of subterranean existence. The Kentucky cave shrimp is one of only two known species of the genus *Palaemonias* and is one of only three existing species of its family found in North America north of Mexico.

On April 28, 1975, the Service published in the Federal Register (40 FR 18476-18477) a notice that it was reviewing the status of 57 species of freshwater crustaceans, including the

Kentucky cave shrimp. The Kentucky cave shrimp was proposed to be listed as a Threatened species on January 12, 1977 (42 FR 2507). That proposal was withdrawn on December 10, 1979 (44 FR 70796) under a provision of the 1978 Amendments to the Endangered Species Act of 1973 that required withdrawal of all pending proposals that were not made final within 2 years of proposal or within 1 year after passage of the Amendments, whichever period was longer.

On March 28, 1980, the Service published a notice (45 FR 20502) announcing the acceptance of a petition submitted by Dr. Raymond W. Bouchard to list the Kentucky cave shrimp as an Endangered or Threatened species. By this action, the Service determined that the petition contained sufficient new evidence to repropose listing this species as Endangered or Threatened. The 1980 notice also solicited comments from interested persons having knowledge of this species, threats to the species, or possible impacts of listing. The Service proposed Endangered status and Critical Habitat for the Kentucky cave shrimp on October 17, 1980 (45 FR 68975) and a public meeting on the proposal was held on December 10, 1980, in Bowling Green, Kentucky. The National Park Service then proposed to undertake a study of the status, distribution, and life history of the Kentucky cave shrimp. The Service delayed final action on the listing proposal to allow time for the National Park Service study because the study could have provided information that would modify the final rule listing the shrimp and determining its Critical Habitat. The National Park Service selected Dr. John R. Holsinger and Mr. Arthur T. Leitheuser of Old Dominion University, Norfolk, Virginia, to carry out this study. These researchers have determined that the Kentucky cave shrimp inhabits streams in base (the lowest) level passages of the Flint-Mammoth Cave System within Mammoth Cave National Park (Holsinger and Leitheuser, 1982, 1983). They estimated the total population size for the species to be about 500 individuals. They have also presented evidence that individuals breed year-round and can reproduce outside of the quiet pool habitat where reproduction had been observed during earlier studies (Barr and Kuehne, 1971).

Holsinger and Leitheuser have discovered shrimp in areas outside of the proposed Critical Habitat of the Roaring River passage. These areas include Mystic River, Echo River, Styx River, Lake Lethe, Colossal River, and

the Golden Triangle. All of these areas are within the cave systems of Mammoth Cave National Park. These additional areas are not being included in the present designation of Critical Habitat because there has not been sufficient opportunity for public comment on such an inclusion. These areas may be included in future proposals to revise Critical Habitat for the Kentucky cave shrimp. Although these additional areas are not being determined as Critical Habitat at this time, the present listing of the Kentucky cave shrimp as Endangered provides protection for all individuals of this species, whether or not they are within the designated Critical Habitat.

On July 23, 1983, Mr. Arthur Leitheuser entered Blue Spring in Hart County, Kentucky, and sighted two crustaceans that he presumed to be Kentucky cave shrimp. This habitat is located in an oil field where wells are still occasionally drilled. The Service is withholding recognition of this population as belonging to the same species as the Kentucky cave shrimp until individuals are collected and their taxonomic status can be determined. If this population is identified as consisting of Kentucky cave shrimp, it will receive protection as an Endangered species along with all other populations of this species as a result of the present rule.

The Service had been considering the designation of the Kentucky cave shrimp as a Threatened species rather than Endangered, as proposed, based on Mr. Leitheuser's evaluation that the species' population was stable. Since that time, Holsinger and Leitheuser have determined that cave faunas in the Mammoth Cave area have significantly declined over the last 10 years as a result of ground water pollution.

A public hearing on the proposal to list and designate Critical Habitat for the Kentucky cave shrimp was held at Mammoth Cave National Park, Kentucky, on June 28, 1983.

Summary of Comments and Recommendations

The testimony presented at the public meeting and the public hearing and all written comments received by August 22, 1983, are part of the public record and have been carefully considered in the drafting of this final rule. These written and oral comments are summarized in this section of the rule.

Representative William H. Natcher expressed concern that the listing of the Kentucky cave shrimp under the Act was for the purpose of removing Lock and Dam 6 on the Green River. Concerns about the possibility that listing of the

shrimp would result in the removal of Lock and Dam 6 and the economic impacts that this removal would entail were expressed in comments by the Joint City-County Planning Commission of Barren County, the Barren Fiscal Court, the City of Cave City, the Barren River Area Development District, and Green River Boat Concession, Inc. The Office of the Chief of Engineers, Department of the Army, commented that the flooding impacts of Lock and Dam 6 on Mammoth Cave may be minimal. Comments that described the threat of Lock and Dam 6 to the shrimp were submitted by the National Speleological Society, the National Parks and Conservation Association, the Cave Research Foundation, and four individuals. One additional individual commented that listing the shrimp and the status of Lock and Dam 6 should be regarded as separate issues, with each evaluated on its own merits. The Service responds that the listing of the shrimp is based on the best available scientific information on the status of the species. Although Lock Dam 6 probably eliminated some pool habitat of the shrimp when it was built in 1906, the coexistence of that structure and the shrimp from that time until now indicates that Lock and Dam 6 is not likely to jeopardize the continued existence of the species. Listing of the shrimp is therefore not likely to affect the operation of Lock and Dam 6. Moreover, the Service's determination of Endangered or Threatened status for a particular species must focus *solely* on the five criteria listed in section 4(a)(1) of the Act and the biological data relevant to those criteria; economic impacts are relevant to the designation of Critical Habitat, but not to the listing determination.

The Office of the Chief of Engineers commented that releases from reservoirs do not have a significant effect on the shrimp. The Barren River Area Development District commented that the listing of the shrimp may require regulation of discharges from these reservoirs. The National Speleological Society, the Cave Research Foundation, the Kentucky Nature Preserves Commission, and 13 individuals commented that unseasonal flooding from reservoir releases is a threat to the shrimp. If future study should establish that these releases may affect the shrimp, the U.S. Army Corps of Engineers would be required to consult with the Service under section 7(a)(2) of the Act on their release schedules.

Concerns that the listing of the shrimp would interfere with the development of sewage treatment facilities were

expressed in comments from the Joint City-County Planning Commission of Barren County, the City of Park City, the City of Cave City, and the Barren River Area Development District. The inadequacy or lack of sewage treatment facilities was cited as a threat to the shrimp in comments by the National Speleological Society, the National Parks and Conservation Association, the Kentucky Nature Preserves Commission, and 16 individuals. The U.S. Environmental Protection Agency (EPA) commented that development of sewage treatment facilities is consistent with protection of the shrimp under the Act. EPA also noted that the proposal of protective status for the shrimp was not anticipated to cause delays in the completion of the Environmental Impact Statement on wastewater facilities in the Mammoth Cave area. The Service agrees with EPA's comments and notes that although communities cannot be forced to develop treatment facilities under present laws or regulations, any development of such facilities would be viewed as favorable to the conservation of the shrimp.

The Kentucky Nature Preserves Commission supported the listing of the shrimp based on its limited range and abundance. Additional comments in support of listing were submitted by Kentucky Department of Fish and Wildlife Resources, the National Parks and Conservation Association, the National Speleological Society, the Cave Research Foundation, the Nashville Grotto of the National Speleological Society, the Environmental Council of Volusia County, and 23 individuals.

Comments stating that the available scientific data were not sufficient for listing were received from the Joint City-County Planning Commission of Barren County, the Barren Fiscal Court, the Hart County Fiscal Court, the Edmonson County Fiscal Court, the Hart County Planning Commission, the City of Park City, the City of Cave City, the Munfordville Chamber of Commerce, the Mammoth Cave National Park Association, the Horse Cave Chamber of Commerce, the Barren River Area Development District, the Hart County Bank and Trust Company, and four individuals. The Service responds that the intensive 2-year study of the Kentucky cave shrimp makes it one of the world's best known cave animals. Its very small population size, of about 500 individuals, and limited habitat make it vulnerable to extinction. These factors and the existence of threats of population of ground water supplying its habitat justify its designation as Endangered under the Act.

Comments from the Joint City-County Planning Commission of Barren County and the Barren River Area Development District stated that a decline in the population size of the shrimp had not been demonstrated. Green River Boat Concession, Inc. questioned whether the shrimp was extinct in a comment dated November 18, 1980. Following the collection of live shrimp a few days later, Green River Boat Concession, Inc. stated in a comment dated December 6, 1980, that no proof existed that the shrimp were near extinction. A discussion and comparison of present and past population sizes may be found in the "Factors Affecting the Species" section of this rule. The Service notes that species may qualify for listing in the absence of a demonstrated decline in population size if, as in the case of the shrimp, threats exist to the survival of the species.

The City of Cave City and City of Park City commented that the shrimp is more widespread than previously known and that other, unknown populations of the shrimp may exist. The Service responds that, although the National Park Service study has resulted in the discovery of some previously unknown habitat, the known range of the species is still very small. Repeated searches of numerous additional caves have located only one possible additional population. The Service notes that any additional populations that may exist would likely face the same threats as the known populations, and therefore any new discoveries would be unlikely to change the classification of the species under the Act.

The Joint City-County Planning Commission of Barren County and the City of Park City commented that the shrimp are more numerous now than in previous years. The Service responds that the sightings of more shrimp since the National Park Service study began is the result of more intensive searches and increased knowledge of their habitat. No increase in estimated population size has been noted during this period.

Comments opposing the listing on the basis of its economic effects were submitted by the Hart County Fiscal Court, the Joint City-County Planning Commission of Barren County, the Hart County Planning Commission, the Edmonson County Water District, the Barren River Area Development District, Green River Boat Concessions, Inc., the Munfordville Chamber of Commerce, and one individual. The Service responds that decisions on listing must be based on the best available scientific and commercial information on the

species and not on economic considerations. Economic impacts must, however, be considered when designating Critical Habitat. The Service, however, has gathered and examined extensive data on the possible economic impacts of designating the shrimp's Critical Habitat and has found no such economic impacts.

Comments stating that the shrimp was sufficiently protected by the National Park Service were received from the Hart County Fiscal Court, the Edmonson County Fiscal Court, the City of Park City, the Mammoth Cave National Park Association, the Barren River Area Development District, the Horse Cave Chamber of Commerce, and three individuals. The Service agrees that the National Park Service adequately protects this species from taking. The Service notes, however, that taking is not a major threat to this species and that the major threats to this species originate outside the park and beyond National Park Service control.

The Barren River Area Development District commented that the Service did not allow adequate time for the preparation of comments before and after the June 28, 1983, public hearing. The Service responds that the amount of advance notice of the hearing and the associated comment period exceeded those required by the Act and its implementing regulations. Ample opportunity for public participation was provided in this proceeding.

Comments opposing the listing and citing its negative impact on tourism and recreational use of Mammoth Cave National Park were received from the Edmonson County Water District, Green River Boat Concession, Inc., and one individual. The Service responds that listing the shrimp will have no effect on these activities. The shrimp's habitat is almost entirely in areas that are not used for regular public tours. A boat trip on Echo River is in an area occupied by shrimp, but the Service does not consider that activity harmful to the shrimp.

Green River Boat Concession, Inc. and 12 individuals commented that salt brine was introduced into the Green River in the early 1960's by oil drilling and that this pollution caused the decline in the shrimp population. The Service agrees that this could have had an adverse effect on the shrimp.

Hart County Bank and Trust Company commented that the public hearing on the listing was held "in an almost secretive fashion." The Service responds that the hearing was announced in advance in the *Federal Register*, announcements were placed in local

newspapers, a press release was issued, and the then-upcoming hearing was covered in news reports in the local media.

In their early comments on the proposal, the Cave Research Foundation, the National Parks and Conservation Association, and the National Speleological Society suggested that areas other than the originally proposed Roaring River passage be considered for inclusion in the Critical Habitat. The Service responds that there has not been sufficient opportunity for public comment on additional areas to include them in the Critical Habitat at this time. These areas may be included in future proposed revisions of Critical Habitat.

Two individuals commented on known incidents of pollution in caves in the Mammoth Cave area on how these incidents demonstrate the vulnerability of these cave habitats. The Service agrees with these individuals on the significance of these events.

One individual commented in favor of listing the shrimp on the basis that its rarity makes it prone to extinction.

One individual submitted life history data collected prior to 1967 on shrimp in cave pools.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement listing provisions of the Act (codified at 50 CFR Part 424; under revision to accommodate 1982 Amendments) set forth the procedures for adding species to the Federal list. A species may be determined to be an Endangered or a Threatened species due to one or more of the five factors described in section 4(a)(1) of the Act. These factors and their application to the Kentucky cave shrimp (*Palaemonias ganteri*) are as follows.

A. The present or threatened destruction, modification, or curtailment of its habitat or range. The entire known population consists of about 500 individuals in streams in base level cave passages within Mammoth Cave National Park. Holsinger and Leitheuser have searched 95 other localities in 37 caves and found only one possible additional population at Blue Spring in Hart County, Kentucky. Much of the habitat is newly discovered as shrimp habitat and therefore no long-term estimates of abundance are available for these areas. For other localities, comparisons of historical collections with the recent population estimates of Holsinger and Leitheuser provide the only possible indications of population

trends. Fage (1931) reported collecting 25 shrimp from Styx River in 1928. The current estimated population size for Styx River is four individuals. Populations were intermittently studied and collections made of shrimp in the "shrimp pools" of the Roaring River passage from the discovery of the shrimp in 1901 until 1967. Only one shrimp has been seen in these pools during recent studies.

The Kentucky cave shrimp is threatened by contamination of the ground water flow to its habitat. Several nearby communities either have inadequate sewage treatment facilities or lack such facilities altogether (Environmental Protection Agency, 1981). The resulting contaminated ground water can enter the cave systems of Mammoth Cave National Park (Quinlan and Ewers, 1981). An additional potential threat is the entry into the ground water of contaminants from traffic accidents and roadside businesses. One incident in 1979 caused the death of aquatic cave organisms in a cave system that is connected to the Flint-Mammoth Cave System. In a 1980 incident, a truck carrying toxic cyanide salts overturned on Interstate Highway 65, just south of Mammoth Cave National Park.

B. Overutilization for commercial, recreational, scientific, or educational purposes. Not applicable to this species.

C. Disease or predation. Not applicable to this species.

D. The inadequacy of existing regulatory mechanisms. National Park Service regulations are adequate to protect this species from taking. The threats to its habitat are from sources outside of the park over which the National Park Service has no control.

The Commonwealth of Kentucky's Kentucky Nature Preserves Commission has determined this species to be Endangered in Kentucky. That designation, however, carries no legal protection.

E. Other natural or manmade factors affecting its continued existence. The very small estimated population size (500 individuals) of this species makes it especially vulnerable to extinction.

Critical Habitat

Critical Habitat as defined by section 3 of the Act and 50 CFR Part 424 means: (i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection, and (ii) specific areas outside

the geographical area occupied by a species at the time it is listed upon a determination by the Secretary that such areas are essential for the conservation of the species.

The Act requires that, at the time of listing, Critical Habitat be determined to the maximum extent prudent and determinable. Critical Habitat is being designated for the Kentucky cave shrimp to include the Roaring River passage of Mammoth Cave National Park. As described in the background section of this rule, additional areas known to contain shrimp populations may be included in future proposals to revise this species' Critical Habitat. The total designated Critical Habitat amounts to about 1 mile of cave passages.

The Critical Habitat consists of a stream in a base level cave passage. This stream is characterized by abundant quantities of organic matter and sediments of coarse silt and very coarse to very fine sand.

The activities that adversely affect Critical Habitat were described above under "Summary of Factors Affecting the Species."

The Service has examined all known ongoing or planned Federal activities that might affect this Critical Habitat and finds that none of these will be affected by this Critical Habitat designation. These activities are identified and discussed under "Summary of Comments and Recommendations."

Available Conservation Measures

Conservation measures provided to species listed as Endangered or Threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by other Federal, State, and private agencies, groups, and individuals. The Endangered Species Act requires that recovery actions be carried out for all listed species and these are initiated by the Service following listing. The protection required by Federal agencies and other prohibitions are discussed in detail below.

Subsection 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species which is proposed or listed as Endangered or Threatened. Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed

species. When a species is listed, section 7 requires Federal agencies to ensure that activities they authorize, fund or carry out are not likely to jeopardize its continued existence or to adversely modify its Critical Habitat. If an adverse effect is expected the Federal agency must enter into consultation with the Service. The Service has examined all known or planned Federal activities that might affect Critical Habitat of the Kentucky cave shrimp and finds that none of these will be affected by this Critical Habitat designation.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all Endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce a listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife which was illegally taken. Certain exceptions would apply to agents of the Service and State conservation agencies.

National Environmental Policy Act

An Environmental Assessment has been prepared in conjunction with this final rule. Based on this Environmental Assessment, a determination has been made that this is not a major Federal action that would significantly affect the quality of the human environment within the meaning of section 102(2)(C) of the National Environmental Policy Act of 1969 (implemented at 40 CFR Parts 1500-1508).

The Critical Habitat designation in this rule entails no recordkeeping requirements as defined by the Paperwork Reduction Act and will not have a significant economic effect on a

substantial number of small entities as defined by the Regulatory Flexibility Act. This Critical Habitat is not a major rule under Executive Order 12291.

Author

The primary author of this rule is Steven M. Chambers, Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240 (703/235-1975).

References

- Barr, T. C., Jr., and R. R. Kuehne. 1971. Ecological studies in the Mammoth Cave System of Kentucky II: The ecosystem. *Ann. Speleologie* 26(1):47-96.
- Environmental Protection Agency. 1981. Final Environmental Impact Statement: Mammoth Cave Area; Kentucky; Wastewater Facilities. EPA 904/9-81-076. Atlanta.
- Fage, L. 1931. Crustaces amphipodes et decapodes, pp. 361-374. In: C. Boliver and R. Jeannel (eds.) *Biospeleologica LXI: Campagne Speologique dans l'Amerique du nord en 1928 (Premiere Serie)*. Archives de Zoologie Experimentale et General 71:293-499.
- Hay, W.P. 1901. Two subterranean crustaceans from the United States. *Proc. Biol. Soc. Washington* 14:179-180.
- Holsinger, J.R., and A.T. Leitheuser. 1982. Ecological Analysis of the Kentucky Cave Shrimp, *Palaemonias ganteri* Hay. Report to National Park Service, Atlanta.
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Mammoth Cave National Park (Phase III). Report to National Park Service, Atlanta. Quinlan, J.F., and R.O. Ewers. 1981. Hydrogeology of the Mammoth Cave Region, Kentucky. pp. 457-495. In: T.G. Roberts (ed.). *GSA Cincinnati 1981 Field Trip Guidebooks*. American Geological Institute, Washington, D.C. VOL. III.

List of Subjects in 50 CFR Part 17

Endangered and Threatened Wildlife, Fish, Marine mammals, Plants (agriculture).

Regulations Promulgation

PART 17—[AMENDED]

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below.

1. The authority citation for part 17 reads as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; and Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. Section 17.11(h), Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended by adding the following entry alphabetically to the table under the heading "Crustaceans" as set forth below.

§ 17.11 Endangered and threatened wildlife.

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Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Shrimp, Kentucky cave.	<i>Palaemonias ganteri</i>	U.S.A. (KY).....	NA.....	E.....	17.95(h)...	NA	

3. It is further determined that § 17.95(h), Crustaceans, be amended by adding the Critical Habitat of the Kentucky cave shrimp as follows:

§ 17.95 Critical habitat—fish and wildlife.

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(h) * * *

Kentucky Cave Shrimp (*Palaemonias ganteri*)

Kentucky, Edmonson County: The Roaring River passage of the Flint-Mammoth Cave System in Mammoth Cave National Park.

Edmonson County, KENTUCKY



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G. Ray Arnett,

[FR Doc. 83-27869 Filed 10-11-83; 8:45 am]
